

Working together for clean air


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Puget Sound Clean Air Agency

**Exploring impactful ways to share
air toxics information collected in
an Environmental Justice
community in Tacoma, WA**



Puget Sound Clean Air Agency
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We will now explore as a group some of the ways that we can share air toxics information we collected in an environmental justice community.

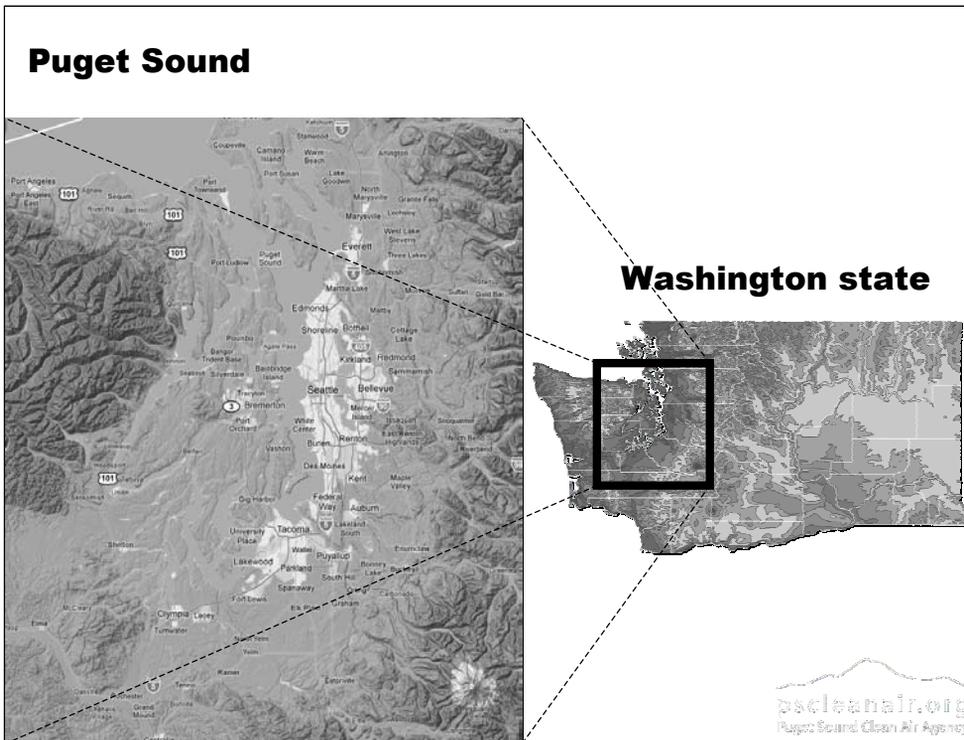
Overview

- **Review Air Toxics sampling project conducted in the Tacoma/Pierce county PM_{2.5} non-attainment area**
- **Preliminary results**
- **Initial communication concepts**
- **Interactive dialogue with the audience**



We are first going to summarize the air toxics sampling project that we are currently in the midst of and then show some preliminary results. The area was designated non-attainment for the 24-hour PM_{2.5} standard last December and truly addressing the air quality issues is vital.

After demonstrating our air quality results, I'll hand the time over to Amy who will cover initial communication concepts and guide a discussion with you on your experiences and ideas.



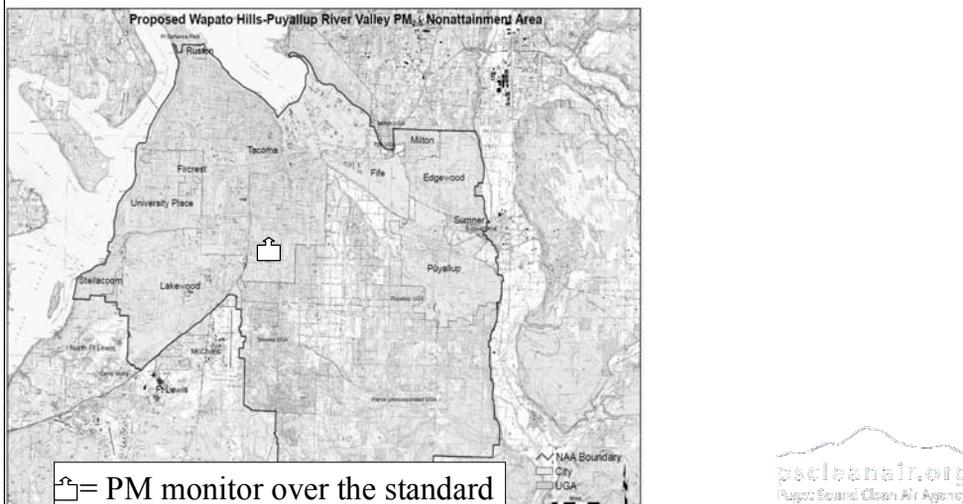
We are located in the far northwest, in Puget Sound, in Western Washington State. And an obvious question may be – is the air quality the same through out Puget Sound?



And furthermore, how does Seattle compare to Tacoma? There have been a number of studies that have collected air toxics information for Seattle, but we have never truly investigated the Tacoma area.

PM Non-Attainment

- 24-hour PM_{2.5} Non-Attainment Area for Pierce County
- Many stakeholders with concerns
- Central to the issue: Everyone's health is at risk



This is becoming more and more relevant as the Tacoma area was just designated as non attainment for the 24-hour PM_{2.5} standard.

As the map illustrates with such a large area covered, there are number of stakeholders with concerns. These include the City of Tacoma, Pierce County, the Port of Tacoma – who has been actively engaged in our diesel emission reduction programs, and our Hearth Partners that are concerned about what their product may be doing to the community, and especially the community that wants the issue addressed.

What is central is that the entire community's health is at risk, and this includes a number Environmental Justice-impacted areas. So to better understand the risks and sources in the community, we collected air toxics information.

Why this project?

- **2 Major Questions:**
 - Is existing toxics data from Seattle truly reflective of the situation in Tacoma?
 - What is the impact of wood smoke, diesel, motor vehicles, trains, marine vessels and industry on our health?

- **Two EPA grants: Community Monitoring and Methods Development**

- **Partnered with the University of Washington**

- **Sampling Duration: November 2008 to October 2009**

- **Final results: June 2010**



With this project we hoped to answer a couple of questions. 1: Is existing toxics data from Seattle truly reflective of the situation in Tacoma? AND 2: What is the impact of wood smoke, diesel, motor vehicles, trains, marine vessels and industry on our health?

We are grateful to EPA for providing us with grants to help us with this work and the University of Washington who is also partnering with us on this project. Without these grants, we would have a lot of difficulty understanding this non-attainment issue.

We started sampling in November of 2008 to collect the full winter heating season and collected 1 full year of data. We are in the midst of doing the analysis and have a report due the end of June. Some of the sampling included:

Project Overview

● 1 year of air monitoring at:

- 4 sites for:
 - ▲ Volatile Organic Compounds
 - ▲ Carbonyl Compounds
 - ▲ Levoglucosan (Wood Smoke Marker)
 - ▲ PM_{2.5}

- 3 Sites for:
 - ▲ Polycyclic Aromatic Hydrocarbons
 - ▲ Meteorological Monitoring

- 2 Sites for:
 - ▲ Speciation of metals, ions, and carbon

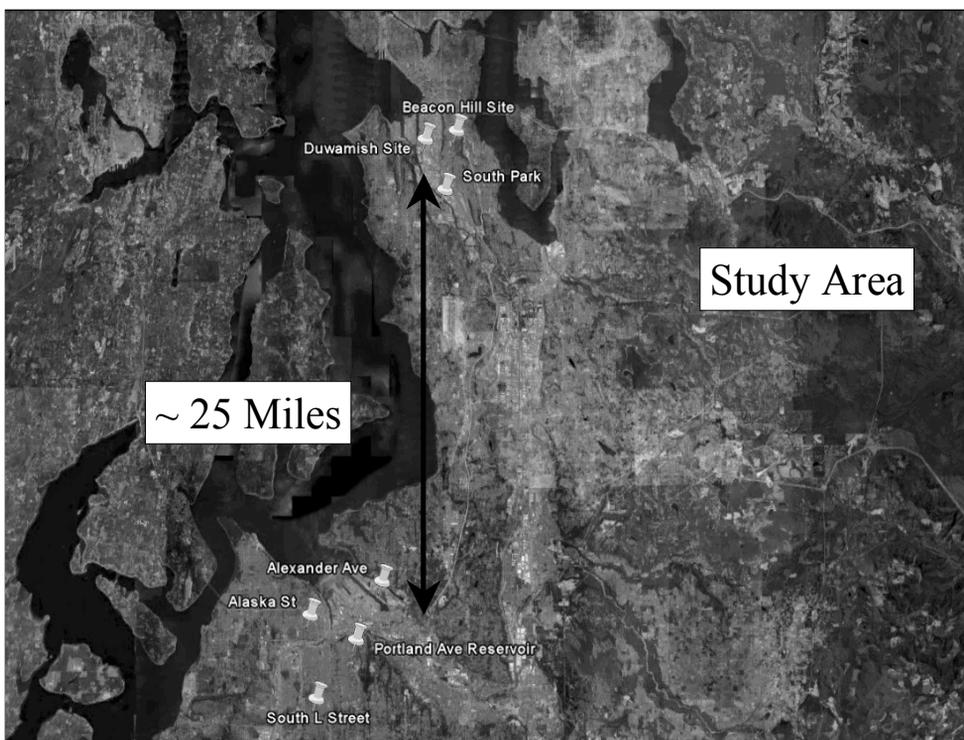
- 1 Site for:
 - ▲ 1-nitropyrene (Diesel Marker)
 - ▲ Non-methyl organic hydrocarbons (Ozone Precursors)

- Mobile Monitoring

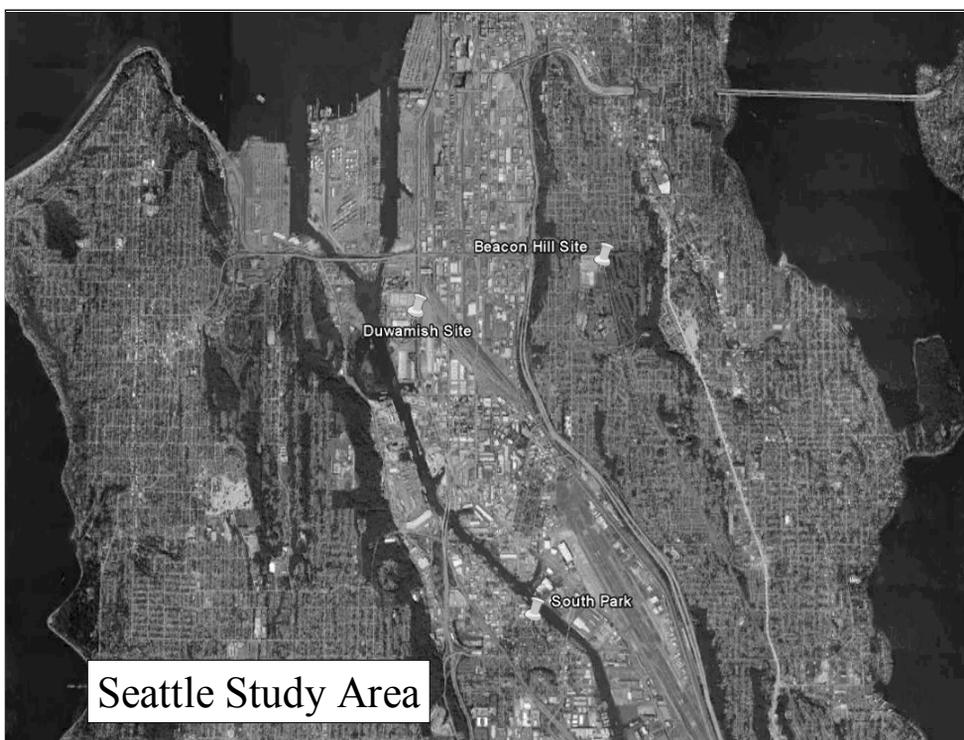


VOC's, PAH's, NMOH's! 1 critical thing to think about is that we are a community of acronyms, and when you tell stakeholders that we have a whole lot of VOCs, you need to at least know what that stands for and at least some idea of what the health implications are and where they come from. Without explaining how bad is bad, a lot of PAH's could mean a lot of nothing.

To not get bogged in the details, we essentially monitored for over 150 parameters for this study! That is a lot of information, and not all of it is bad, so understanding how to use this information is crucial. I now want to introduce you to the study area:

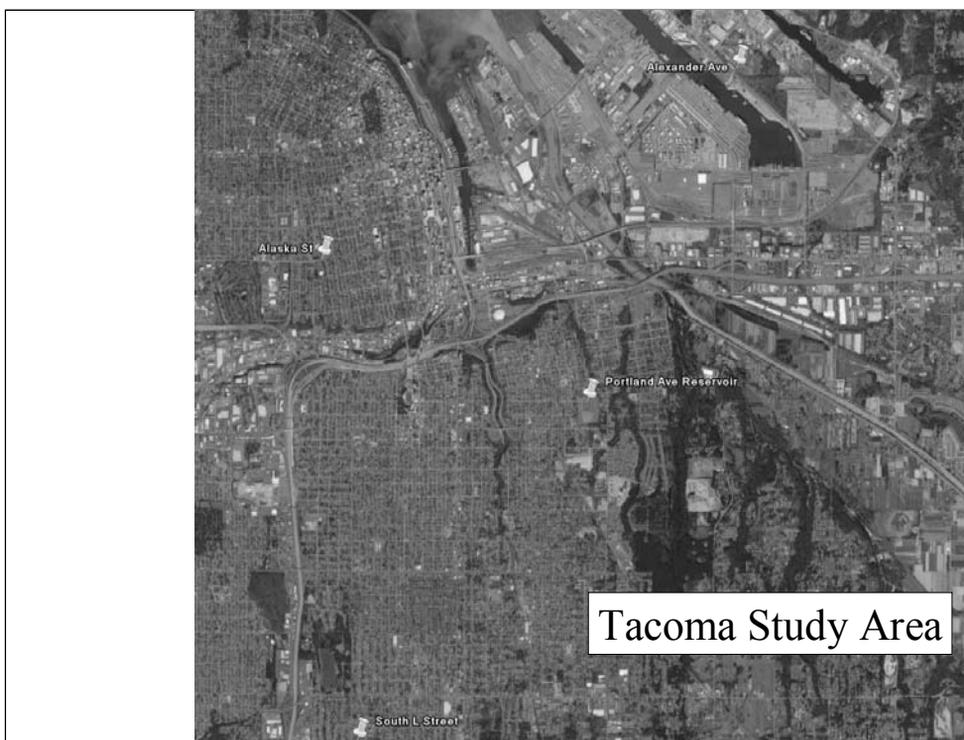


Tacoma is 25 miles south of Seattle. In this study, we aimed to compare Seattle to Tacoma, and additionally do intra city comparisons as well. We can now take a closer look at the Seattle sites:



This satellite image shows the our Duwamish site that sits in an industrial valley and the Beacon Hill residential site that sits up on a hill. The Beacon Hill site is operated by the Dept. of Ecology and is a National Air Toxics Trends Site. Interstate 5 bisects the 2 sites and carries over 200 thousand vehicles per day. The South Park site is a mixed commercial/residential use neighborhood that sits in the Duwamish valley and is subject to some of the same pollution from the heavy industry. We have a lot of experience with this Environmental Justice site. An elementary school in South Park was also monitored as part of EPA's School Air Toxics Study.

Now to show the Tacoma sites:



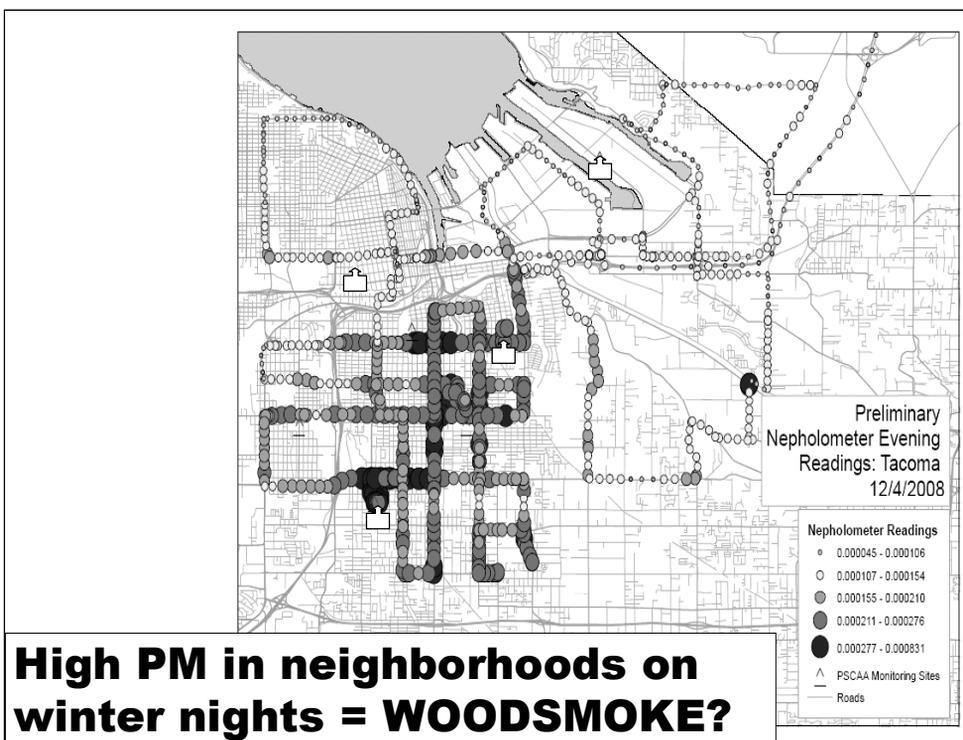
Tacoma is similarly bisected by interstate 5.

We have 2 permanent sites: the Tacoma South L Street and Tacoma Alexander sites.

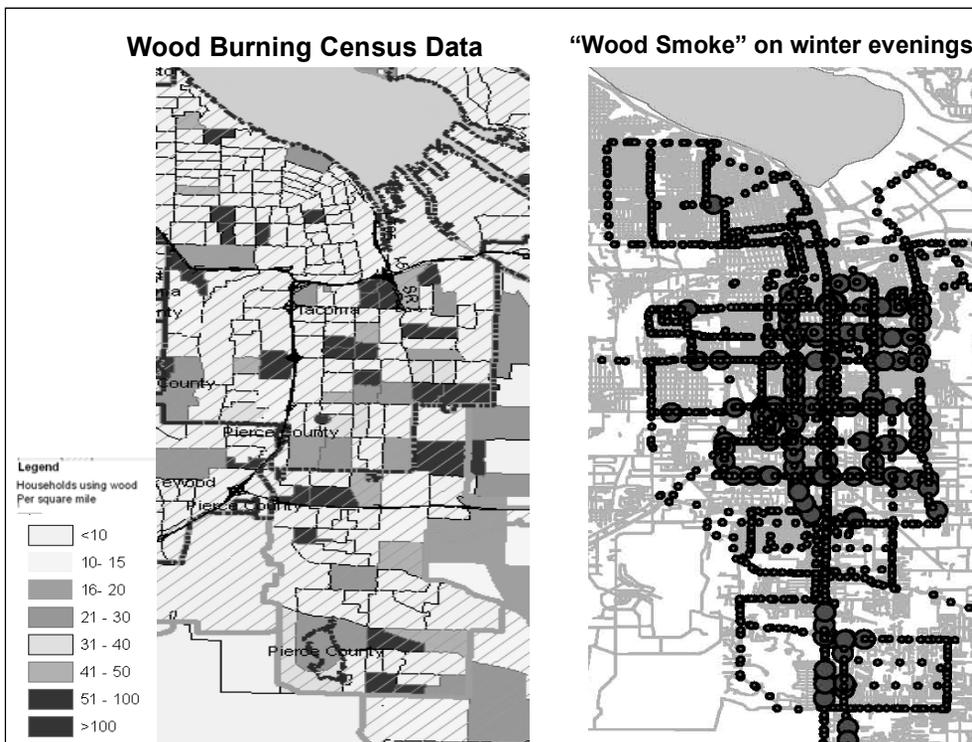
The Alexander Ave site sits in the Port of Tacoma while the South Tacoma site sits in a residential neighborhood.

2 Study monitors Alaska Avenue and Portland Avenue were put in as an Environmental Justice Component and we worked with stakeholders on the siting of these 2 sites. These are also amidst residential neighborhoods.

In addition to the fixed site monitoring, we performed mobile monitoring to understand all the air quality in between. I'll now show some of the preliminary results and our findings.



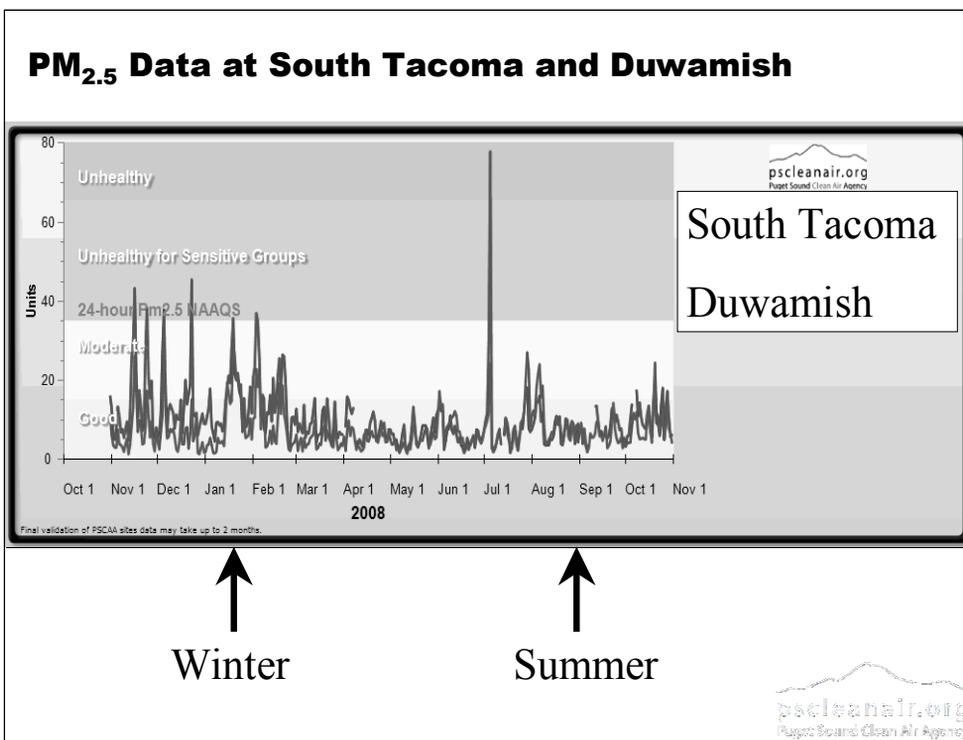
This is essentially a map of PM_{2.5} readings in the Tacoma area on a winter night. Most striking is that the most concentrated levels are in the residential neighborhoods and NOT tied to I-5 or the industrial Port area in the north. We performed further analysis by determining a species that we could describe as “wood smoke” and not just PM_{2.5}. The following slide shows some of these conclusions.



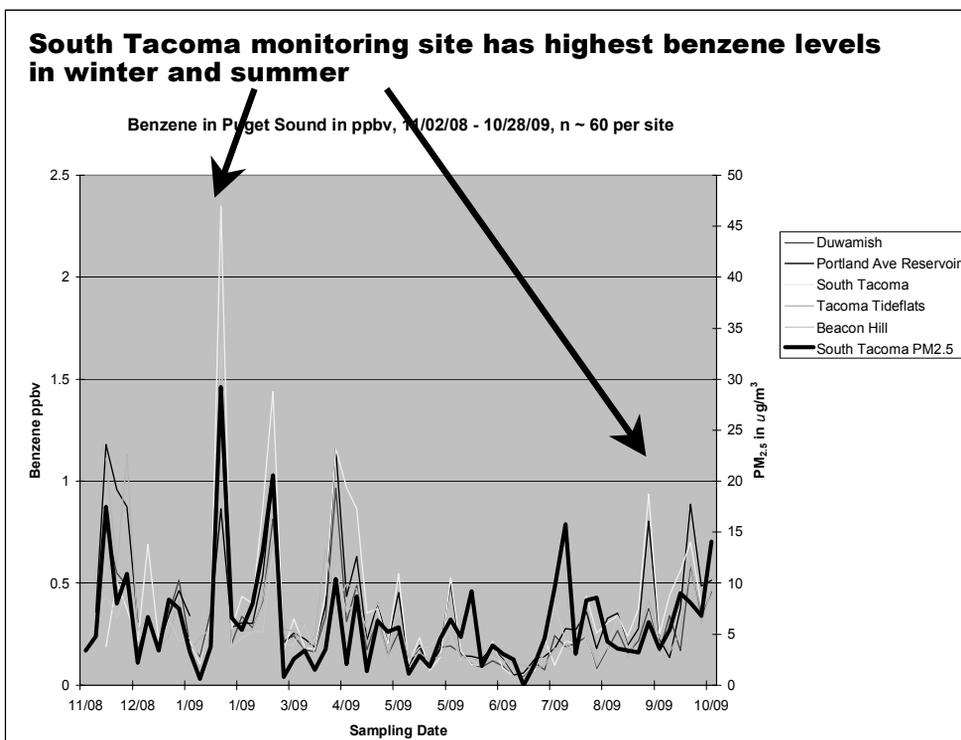
Now the first image is census data of households that use wood as a source of heat. The image on the left is our "wood smoke factor" and there are striking similarities that help demonstrate that the series of compounds we used is in fact wood smoke.

Additionally, I just want to highlight how using wood burning census data can be a good predictor of air quality and can be helpful in determining site locations and potential problems.

There is one more item that I want to show that highlights some of the differences between our heaviest industrial area to the South Tacoma non-attainment monitor.



This image shows PM_{2.5} overtime with South Tacoma in red and the Duwamish in Seattle in Purple. In winters, ST is higher in the winter and lower in the summer. And of course, on July 4th we celebrate our country by making all monitors across the country spike. The Duwamish has the highest annual PM_{2.5} average in the state, but does not reach the 24 hour non-attainment levels as does these residential neighborhoods. Now one of our most interesting findings from this is how benzene trends.



This image is benzene over time for our study sites. Interestingly, benzene is highest in this non-attainment residential neighborhood in the winter AND the summer. There may be an artifact of interstate 5 or other baseline sources that are detected in the summer, but the winter has significantly higher levels presumably due to wood smoke. Usually benzene is only equated with motor vehicle traffic, but this carcinogen is significantly elevated in the winter. We are still piecing this together in our current analysis. Now, in our agency, my job is to point out to Amy, “Hey, look, here is why wood smoke is the biggest issue in this area”. And this is where I usually step aside and let her handle it from here.

The Challenge

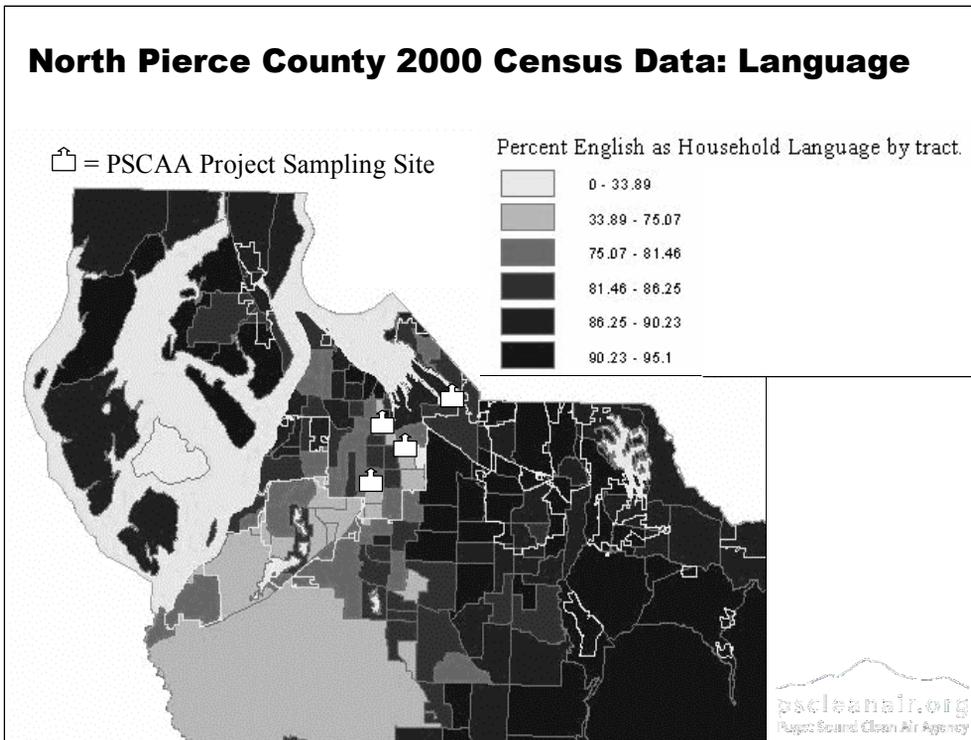
- **Large non-attainment area – urban, suburban and rural including many varied EJ-impacted communities**
- **The problem: it's wood smoke, not industry**
- **The goal:**
 - **Bring diverse group of stakeholders together to assist in non-attainment process**
 - **Create a strong network of partners to implement long-term strategies, long-term results**



Our challenge as the local clean air agency is to help the community know and understand that there is an air-quality concern in their Greater Tacoma area, and while it has resulted in a non-attainment designation for fine particle pollution, we should not get bogged down into the technicalities and bureaucracy of that but to instead focus on what it means to them:

- The public's health is at risk – that's you, your family, and neighbors -- because of the high wintertime pollution levels
- That the culprit for these high pollution levels is not industry, the local Port, Interstate-5 or nearby joint military base – even though that is typically the public's perception – but rather it is the way we heat our homes and the pollution it produces

Our overall goals are to be able to bring into our stakeholder process a diverse range of community representatives so they are informed and engaged in the non-attainment process and in the long-term will champion our PM reduction strategies to ensure we will have long-term results.



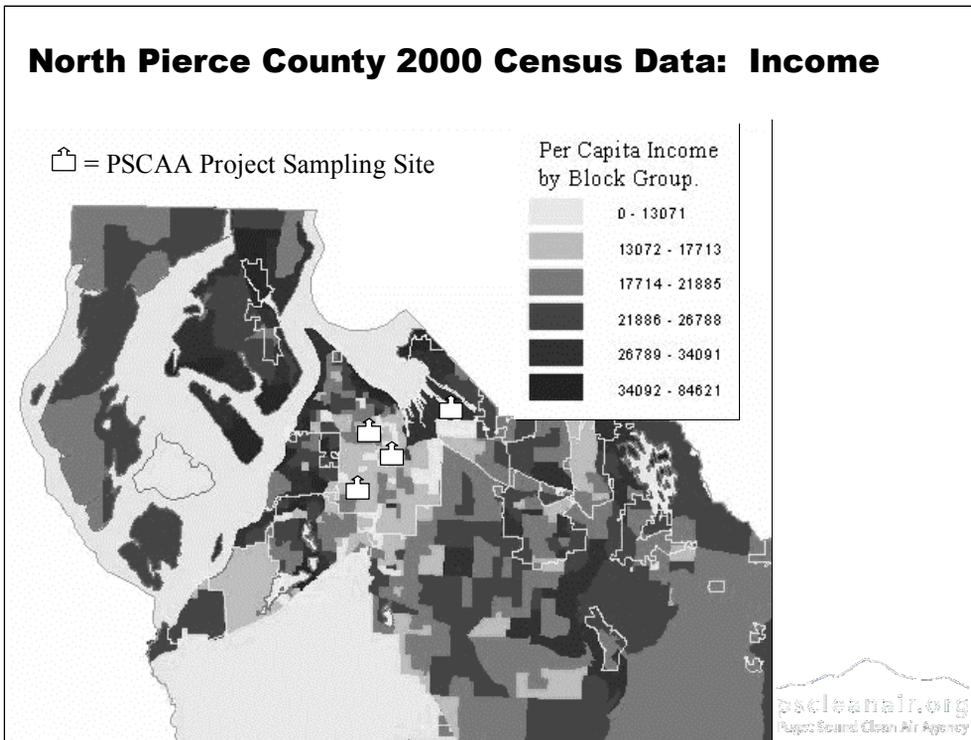
To help you get a sense of the community, we are talking about a significant portion of one of the more-populated counties in Washington state.

The PM2.5 nonattainment area encompasses about two-thirds of Pierce County – home to over 813,000 people and includes the City of Tacoma with over 203,000 residents.

As noted earlier, it is urban, suburban and rural

It is a highly diverse area, and here is just a Census snapshot highlighting English-language proficiency. In the more rural yet less populated areas, English language proficiency is quite high, while in the more populated urban area – especially in the neighborhood around our violating monitor, English proficiency ranges from about 33 to 80 percent.

And there is quite a mix of cultures and immigrant populations, ranging from Hispanic to Cambodian, Vietnamese, Korean and Russian – just to name a few.



Here also you can see that income levels are low in the urbanized area where this air toxics study took place and where our violating monitor is located.

Our agency has offered a Wood Stove Replacement Program for the past three heating seasons in this area even before it was officially designated in nonattainment. This program has resulted in nearly 1,000 change-outs. But with 10s of thousands of wood-burning devices in this community, coupled with the poor economy and increased reliance on wood heating, we have not made a significant dent in our wintertime wood smoke problem.

Economic factors are certainly a challenge. Even though our program has offered robust incentives – people are hesitant to give up a free or cheap fuel source (wood) or invest in an equipment upgrade. And while we have worked with utilities and social service agencies to connect folks with resources and programs beyond our own change-out program, it’s not enough.

Engaging with the community: Initial ideas

The results of this air toxics study: part of future discussions, but not a door-opener

- **The usual approach: Circle back with existing partners**
- **The needed approach:**
 - **Seek out and identify community influencers**
 - **Share air quality picture, health concerns, current challenge**
 - **Listen and learn: let community identify their interests, concerns, needs**
 - **Help community to vision change**
 - **Partner on community-based efforts**



So that gets us back to the question of how do we make these needed connections in the community, especially in Environmental Justice-impacted areas most touched by the poorest air quality. And this is often coupled with the older housing stock (many times rented and not owned) with inadequate heating that forces a reliance on wood-burning – which results in more wood smoke?

And how does this latest research and findings come into it?

We recognize that this study, in and of itself, is not the door-opener but it helps us to paint the picture. And we will certainly be circling back with existing partners with the results, those who we've already engaged with when we could see this non-attainment designation on the horizon. But those are the interagency types – city, county, health departments, port partners, and a few neighborhood councils.

But where we next need to make big in-roads is in better connecting with the impacted communities – recognizing that for some, air quality is not one of their top concerns.

This is in addition to needing to meet folks where they are comfortable, sharing information in an understandable way, even through respected neighborhood liaisons, taking a step back to really listen and get to know the community, allowing for active involvement in developing the solutions, and continuing our connections so the community helps (and takes ownership) with implementing the solutions.

Your experiences and ideas?

- **Top challenges to overcome in order to open lines of communication?**
- **How to avoid setbacks in community relationships?**
- **Lessons learned: what NOT to do?**



We certainly don't pretend to be the experts. And while we have scratched the surface in achieving some meaningful engagement in several Puget Sound-area communities, we'd like to hear from those of you from around the county with more experience and some successes under your belt.

Here are a few questions just to get our conversation started.

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